CLAIMS

1. A method of estimating a carrier leak, characterized in that it consists in:
   - varying a complex gain Z applied to the received signal s between at least two values Z1 and Z2;
   - measuring the position (PD1, PD2) of the central carrier of the signal s demodulated for each applied gain (Z1, Z2);
   - calculating at least a part of the carrier leak based on the measured positions PD1 and PD2 and the applied gains Z1 and Z2, the calculated carrier leak part (offset_mod) corresponding to the leak due to the modulator.

2. The estimation method as claimed in the preceding claim, characterized in that the gain Z1 is applied at a given instant (t1) and for a predetermined period T1 and the complex gain Z2 is applied at a given instant t2 and for a predetermined period T2.

3. The estimation method as claimed in any one of the preceding claims, characterized in that Z2=-Z1.

4. The estimation method as claimed in any one of the preceding claims, characterized in that another part of the carrier leak calculated on the basis of the measured positions PD1 and PD2 and the applied gains Z1 and Z2 corresponds to the leak due to the demodulator (offset_dem).

5. The estimation method as claimed in any one of the preceding claims, characterized in that the calculation of at least a part of the carrier leak includes the minimizing of the difference between the two measured positions $\|PD2 - PD1\|$.

6. The estimation method as claimed in the preceding

claim, characterized in that the minimizing is performed by a "gradient" type method.

7. The estimation method as claimed in either one of claims 1 and 4, characterized in that the calculation of at least a part of the carrier leak consists in:

- measuring the gain Z on the basis of the demodulated signal d,
- applying to the measured position PD a gain 1/Z before the carrier position measurement and
- the difference between the duly obtained value and the theoretical central carrier being used to obtain an estimation of the carrier leak for each value of Z (offset_f1 and offset_f2), and
- the operation $\text{offset\_f1} - \frac{1}{Z1}\frac{(\text{offset\_f2} - \text{offset\_f1})}{((1/Z2) - 1/Z1))}$ being used to obtain the part of the carrier leak due to the modulator (offset-mod).

8. The estimation method as claimed in the preceding claim, characterized in that the calculation of at least a part of the carrier leak includes the operation $\frac{(\text{offset\_f2} - \text{offset\_f1})}{((1/Z2) - 1/Z1))}$ used to obtain the part of the carrier leak due to the demodulator (offset_dem).

9. A carrier leak estimator implementing the estimation method as claimed in any one of claims 1 to 8, characterized in that it includes:

- gain variation means (M1) for varying a complex gain Z applied to the received signal s between at least two predetermined values Z1 and Z2;
- measurement and calculation means (M2) for measuring the position (PD1, PD2) of the central carrier of the demodulated signal s for each applied gain (Z1, Z2) and calculating at least a part of the carrier leak based on the measured positions PD1 and PD2 and the applied gains Z1

and Z2, the calculated carrier leak part (offset_mod) corresponding to the leak due to the modulator.

10. The estimator as claimed in the preceding claim, characterized in that it includes a link between the gain variation means (M1) and the measurement and calculation means (M2) enabling the measurement and calculation means (M2) to chose the gain (Z1, Z2) applied by the gain variation means (M1).

11. The estimator as claimed in the preceding claim, characterized in that the gain variation means include two UHF relays or two switches: the first receiving the signal s to which the gain Z1 has been applied, the second receiving the signal s to which the gain Z2 has been applied, the relay corresponding to the gain (Z1, Z2) chosen by the measurement and calculation means (M2) being linked to the output of the gain variation means (M1).

12. The estimator as claimed in either of claims 10 and 11, characterized in that the means of applying the gains include:

- a 0°-90° coupler receiving the modulated signal s and transmitting this signal s to its 0° output (Z1) and the signal s phase shifted by 90° to its 90° output (Z2), or
- a transformer or an amplifier receiving the modulated signal s and transmitting this signal s (Z1), and the signal s phase shifted by 180° (Z2), or
- an electrical length I receiving the modulated signal s and transmitting this signal s (Z1), and the signal s phase shifted by φ dependent on I (Z2).

13. A modulation system with automatic control of the carrier including a modulator receiving the signal to be modulated m and supplying the modulated signal s to be transmitted, characterized in that it includes:
- an estimator as claimed in any one of claims 10 to 12 receiving the modulated signal s,
- a demodulator receiving the signal S_z originating from the gain variation means M1 and supplying to the measurement and calculation means the demodulated signal d,
- carrier automatic control means for adding to the signal to be modulated m the carrier leak due to the modulator (offset_mod) supplied by the measurement and calculation means M2.

14. The modulation system as claimed in the preceding claim, characterized in that the carrier automatic control means can also be used to add to the demodulated signal d the carrier leak due to the demodulator (offset_dem) supplied by the measurement and calculation means M2 before supplying the corrected demodulated signal to the measurement and calculation means M2.

15. The use of the estimation method as claimed in any one of claims 1 to 6 for a modulation with zero central carrier.

16. The use of the estimation method as claimed in any one of claims 1 to 4, or 7, or 8 for a modulation with non-zero central carrier.